424 Rec'd PCT/PTO 07 FEB 2000

FORM PTO-1390 (REV. 5-93)	U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	ATTORNEY'S DOCKET NUMBER 10191/1295
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371		U.S. APPLICATION NO. (If known, see 37 CFR 1.5) 09/485325

INTERNATIONAL APPLICATION NO. PCT/DE98/02260	INTERNATIONAL FILING DATE (06.08.98) 6 August 1998	PRIORITY DATES CLAIMED (11.08.97) 11 August 1997

TITLE OF INVENTION
ELLIPSOMETER MEASUREMENT APPARATUS

APPLICANT(S) FOR DO/EO/US
HAHN, Juergen and KUEHNLE, Goetz

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This express request to begin national examination procedures (35 U.S.C. 371(f)) immediately rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
   a. ☐ is transmitted herewith (required only if not transmitted by the International Bureau).
   b. ☒ has been transmitted by the International Bureau.
   c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US)
6. ☒ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
   a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
   b. ☐ have been transmitted by the International Bureau.
   c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
   d. ☒ have not been made and will not be made.
8. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)). (UNSIGNED)
10. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. below concern other document(s) or information included:

11. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A **FIRST** preliminary amendment.
    ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
14. ☐ A substitute specification.
15. ☐ A change of power of attorney and/or address letter.
16. ☒ Other items or information: Copies of International Search Report, Preliminary Examination Report and Form PCT/RO/101.

EXPRESS NO. EM360462140US

U.S. APPLICATION NO (If known, see 37 CFR 1.5) 09/485325	INTERNATIONAL APPLICATION NO PCT/DE97/02260	ATTORNEY'S DOCKET NUMBER 10191/1295

17. ☒ The following fees are submitted

	CALCULATIONS	PTO USE ONLY
Basic National Fee (37 CFR 1.492(a)(1)-(5)):		
Search Report has been prepared by the EPO or JPO $840.00		
International preliminary examination fee paid to USPTO (37 CFR 1.482) . . . $670.00		
No international preliminary examination fee paid to USPTO (37 CFR 1.482) but international search fee paid to USPTO (37 CFR 1.445(a)(2)) $750 00		
Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1 445(a)(2)) paid to USPTO $970.00		
International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(2)-(4) $96.00		
ENTER APPROPRIATE BASIC FEE AMOUNT =	$840	
Surcharge of $130.00 for furnishing the oath or declaration later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492(e)).	$	

Claims	Number Filed	Number Extra	Rate		
Total Claims	8 - 20 =	0	X $18.00	$	
Independent Claims	1 - 3 =	0	X $78 00	$	
Multiple dependent claim(s) (if applicable)			+ $260.00	$	
TOTAL OF ABOVE CALCULATIONS =				$840	
Reduction by ½ for filing by small entity, if applicable. Verified Small Entity statement must also be filed (Note 37 CFR 1 9, 1 27, 1.28).				$	
SUBTOTAL =				$840	
Processing fee of $130 00 for furnishing the English translation later the ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492(f)). +				$	
TOTAL NATIONAL FEE =				$840	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3 28, 3.31). $40.00 per property +				$	
TOTAL FEES ENCLOSED =				$840	
				Amount to be: refunded	$
				charged	$

a. ☐ A check in the amount of $_____ to cover the above fees is enclosed

b. ☒ Please charge my Deposit Account No 11-0600 in the amount of **$840.00** to cover the above fees A duplicate copy of this sheet is enclosed

c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 11-0600. A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1 137(a) or (b)) must be filed and granted to restore the application to pending status.

By: Richard L. Mayer (Reg. No. 41,172)

SEND ALL CORRESPONDENCE TO:

Richard L. Mayer
SIGNATURE

Kenyon & Kenyon
One Broadway
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Richard L Mayer, Reg. No. 22,490
NAME

2/7/00
DATE

252212

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s)	:	Juergen HAHN et al.
Serial No.	:	To Be Assigned
Filed	:	Herewith
For	:	ELLIPSOMETER MEASUREMENT APPARATUS
Examiner	:	To Be Assigned
Art Unit	:	To Be Assigned

Assistant Commissioner
for Patents
Washington, D.C. 20231

PRELIMINARY AMENDMENT

SIR:

Kindly amend the above-identified application before examination, as set forth below.

IN THE TITLE:

Please replace the title with the following new title:

--ELLIPSOMETER MEASUREMENT APPARATUS--.

IN THE SPECIFICATION:

Please amend the specification as follows:

On page 1, delete line 1, and insert:
--FIELD OF THE INVENTION--.

On page 1, line 3, before "invention" insert --present--, and change "refers" to --relates--.

On page 1, line 5, change ", having" to --. The apparatus includes--.

On page 1, line 10, change ", the" to --. The--.

On page 1, line 11, change "being" to --are--.

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On page 1, line 13, change "being" to --is--.

On page 1, before line 16, insert: --BACKGROUND INFORMATION--.

On page 1, line 16, delete "of this kind".

On page 2, delete line 8, and insert: --SUMMARY--.

On page 2, line 10, change "the" (first occurrence) to --an--, before "invention" insert --present--, and change "make available" to --provide--.

On page 2, line 11, delete "of the kind recited".

On page 2, line 12, delete "initially".

On page 2, delete line 16.

On page 2, line 17, change "this" to --an example embodiment of the present invention--.

On page 2, line 28, before "algorithms" insert --conventional--, and delete "known per se".

On page 4, delete line 8-10, and insert: --BRIEF DESCRIPTION OF THE DRAWINGS--.

On page 4, line 14, change "; and" to --.--.

On page 4, before line 19, insert: --DETAILED DESCRIPTION--.

On page 5, line 16, before "algorithms" insert --conventional--, and delete "known per se".

On page 5, line 37, change "[beta]" to --β--.

On page 6, line 1, change "[gamma]" to --γ--.

On page 6, line 5, change "said" to --the--.

On page 6, line 13, change "preferably" to --for example,--.

On page 7, delete line 1, and insert: --What Is Claimed Is:--.

IN THE ABSTRACT:

Please amend the abstract, as follows:

Line 3, change "The invention relates to an" to --An--.

Line 5, change ", having" to --is described. The apparatus includes--, and delete "(3)".

Line 6, delete "(9)".

Line 7, delete "(9)" and "(P)".

Line 9, delete "(5.4)" and "(10)".

Line 10, delete "(P)" and "(5.7,".

Line 11, delete "5.8)" and "(9)".

Line 12, delete "(5.4)".

Line 14, delete "(7)".

Line 18, delete "(5.7,".

Line 19, delete "5.8, 7.1)" and "([beta])".

Line 20, delete "(10)".

Line 21, delete "(1)" and "(P)".

Line 23, delete "(7)" and "([beta])".

Line 24, delete "(Figure 1)".

IN THE CLAIMS:

Please cancel claims 1-8, without prejudice.

Please add the following new claims:

9. (New) An ellipsometer measurement apparatus for determining a thickness of a film applied on a substrate, comprising:

a light source emitting a beam;

a transmitting optical system conveying the beam to an incidence point on the substrate, the substrate reflecting the beam from the incidence point;

a photodetector device;

a receiving optical system conveying the reflected beam to the photodetector device, the receiving optical system including an analyzer, a polarization direction of the beam and of the analyzer being modified in time relative to one another;

an evaluation device evaluating intensity changes in the reflected beam and determining the film thickness as a function of the intensity changes; and

an angle measurement device sensing an angle of the reflected beam relative to a tangential plane of the substrate at the incidence point, the evaluation device determining the film thickness as a function of the sensed angle.

10. (New) The measurement apparatus according to claim 9, wherein the angle measurement device includes a photodetector unit that is position-sensitive in at least one of an X and Y direction, an angle of reflection being calculated from position data and distance data with an evaluation stage.

11. (New) The measurement apparatus according to claim 10, wherein the intensity changes and the position data are sensed with a same photodetector.

12. (New) The measurement apparatus according to claim 10, wherein the photodetector unit includes two position-sensitive photodetectors arranged at a distance from the incidence point in a beam path of the reflected beam, the angle of reflecting being calculated based on differing positions of the reflected beam on the two position-sensitive photodetectors.

13. (New) The measurement apparatus according to claim 12, further comprising:

a beam splitter arranged in the beam path of the reflected beam in front of the two position-sensitive photodetectors, each of the two position-sensitive photodetectors receiving a partial beam of the reflected beam.

14. (New) The measurement apparatus according to claim 9, further comprising:

a converging lens arranged in front of the photodetector device.

15. (New) The measurement apparatus according to claim 9, wherein the transmitting optical system and the receiving optical system are integrated into a common carrier, the carrier having a three-point support for placement of the film.

16. (New) The measurement apparatus according to claim 9, wherein the transmitting optical system includes a polarizer and a $\lambda/4$ plate in a beam path of the beam, and wherein one of the polarizer and the analyzer is arranged in rotationally driven fashion about an axis normal to a surface of the one of the polarizer and the analyzer.

REMARKS

This Preliminary Amendment cancels, without prejudice, claims 1-8 in the underlying PCT Application No. PCT/DE98/02260, and adds new claims 9-16. The new claims conform the claims to U.S. Patent and Trademark Office rules and do not add new matter to the application.

The above amendments to the title, the specification and the abstract are, inter alia, to conform the title, the specification and the abstract to U.S. Patent and Trademark Office rules and to correct informalities. The amendments to the title, the specification and the abstract do not add new matter.

The underlying PCT Application No. PCT/DE98/02260 includes an International Search Report, dated March 3, 1999. The Search Report includes a list of documents that were uncovered in the underlying PCT Application. A copy of the Search Report is included herewith.

The underlying PCT application also includes an International Preliminary Examination Report. An English translation of the International Preliminary Examination Report is included herewith.

It is respectfully submitted that the subject matter of the present application is new, non-obvious, and useful. Prompt consideration and allowance of the application are respectfully requested.

Respectfully submitted,

KENYON & KENYON

By: Dos Magnk (Reg. No. 41,172)

Dated: 2/7/00

By: Richard L. Mayer

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252602v1

ELLIPSOMETER MEASUREMENT APPARATUS

Background of the Invention

The invention refers to an ellipsometer measurement apparatus for determining the thickness of a film applied on a substrate, having a light source emitting an incoming beam, a transmitting optical system conveying the polarized incoming beam to an incidence point on the substrate, and a receiving optical system that has an analyzer and conveys the reflected beam formed at the incidence point to a photodetector device, the polarization direction of the incoming beam and of the analyzer being modified in time relative to one another, and the intensity changes produced thereby being evaluated by way of an evaluation device in order to determine the film thickness.

An ellipsometer measurement apparatus of this kind is described in Bosch Technische Berichte, Vol. 4 (1974), No. 7, pages 315-320. It is possible with a measurement apparatus of this kind, for example, to measure the thickness of protective films on aluminum-coated headlight reflectors in the form of a paraboloid mirror with a large aperture ratio; the film thicknesses are in the range from 10 to 50 nm, and a resolution on the order of a nanometer is achievable. For this purpose, a polarized incident beam is directed at a predefined angle of incidence onto a measurement point of the headlight reflector, and is reflected at an angle that is also predefined. The reflected beam is elliptically polarized, and for determination of the ellipticity is conveyed through a rotating analyzer onto a photodetector on which intensity fluctuations of the light signal that correspond to the ellipticity are sensed. The ellipticity and thus the change in intensity depend on the film thickness, so that the latter can be determined in a

downstream evaluation device. The angle of the incident beam and reflected beam in terms of the tangential plane or the normal line at the measurement point is often difficult to establish, and accurate adjustment is almost impossible at difficult-to-access locations or with changing curvature profiles, as in the case of modern headlights.

Advantages of the Invention

It is the object of the invention to make available an ellipsometer measurement apparatus of the kind recited initially that, while easy to adjust and handle, supplies accurate measurement results even at difficult-to-access locations and with differing curvature profiles.

This object is achieved with the features of Claim 1. According to this, an angle measurement device is provided with which the angle of the reflected beam relative to a tangential plane of the substrate at the incidence point can be sensed, and the film thickness can be determined by way of the evaluation device as a function of the angle that is sensed. Because the angle of the reflected beam is sensed and is additionally evaluated in order to calculate the film thickness, the measurement apparatus can easily be placed on the film and the measurement can readily be performed. The resulting angle is automatically and accurately taken into account, and is incorporated into the calculation of the film thickness using algorithms known per se.

Measurement of the angle can also be accomplished in simple fashion by the fact that the angle measurement device has a photodetector unit that is position-sensitive in the X and/or Y direction, as well as an evaluation stage with which the angle of reflection can be calculated from the position data and from distance data. Experiments have shown that even a one-dimensional angle determination yields good measurement results for the film thickness.

The simple configuration is promoted by the fact that the intensity changes and the position of the reflected beam are sensed with the same photodetector of the photodetector device.

A further possibility for easy determination of the angle consists in the fact that the photodetector device has two position-sensitive photodetectors arranged at different distances from the incidence point in the beam path of the reflected beam, and that the angle is calculated on the basis of the differing positions of the reflected beam on the two photodetectors. Here again, one of the photodetectors can be utilized simultaneously to measure the intensity changes of the reflected beam.

When the angle is determined using two photodetectors, the configuration can be, for example, such that a beam splitter is arranged in the beam path of the reflected beam in front of the two photodetectors, and that each photodetector receives a partial beam of the reflected beam. Alternatively, the two photodetectors can also be arranged one behind another, a portion of the reflected beam passing through the front photodetector.

If only one photodetector is used, provision is advantageously made for a converging lens to be arranged in front of the photodetector device.

Simple handling is promoted by the fact that the transmitting optical system and the receiving optical system are integrated into a common carrier, and that the carrier has a three-point support for placement on the film. With this configuration, unequivocal placement on the film is also always guaranteed. The three-point support can comprise, for example, a ball support which on the one hand guarantees single-point support at the three support points and on the other hand prevents damage to the film.

In order to obtain reliable measurement results, it has proven advantageous to use a configuration in which the transmitting optical system has a polarizer and a λ/4 plate in the beam path of the incoming beam, and the polarizer or the analyzer is arranged in rotationally drivable fashion about an axis normal to its surface.

The invention will be explained below in more detail with reference to exemplary embodiments, referring to the drawings in which:

Figure 1 shows a schematic depiction of an ellipsometer measurement apparatus in a partially sectioned side view; and

Figure 2 shows a side view of a further ellipsometer measurement apparatus.

Figure 1 shows a measured object 1 made up of a substrate and a film, applied onto the concavely curved inner side thereof, whose thickness at a measurement point P is to be measured using a measurement arrangement 2.

Measurement arrangement 2 possesses a laser 3, a lens 4 in front of the latter, a light guide 6, a measurement probe 5, and an evaluation device 7. The light beam generated by laser 3 passes through front-mounted lens 4 and light guide 6, as incoming beam 9, into measurement probe 5, and is directed by the latter, through a transmitting optical system having a lens 5.1, a polarizer 5.2, and a λ/4 plate 5.3, onto the measurement point or incidence point P of measured object 1.

The beam reflected at incidence point P, in the form of reflected beam 10, passes, in a receiving optical system, through a rotationally driven analyzer 5.4, a filter 5.5, and a converging lens 5.6, and is focused by the latter onto a photodetector 5.7. Photodetector 5.7 belongs to a

photodetector device that detects on the one hand intensity fluctuations of reflected beam 10, and on the other hand the incidence location on photodetector 5.7. Photodetector 5.7 can be, for example, a position-sensitive detector (PSD) or a CCD camera. A position measuring instrument 7.1 for an X and/or Y position is provided in evaluation device 7. The distance from incidence point P is taken into account when the X and/or Y angle is calculated. Also provided is an intensity measuring instrument 7.2 that senses the intensity fluctuations of reflected beam 10 resulting from the rotation of analyzer 5.7 and serves to calculate the ellipticity.

From the ellipticity, and taking into account the reflection angle ascertained from the X and/or Y angle, the film thickness can be determined using algorithms known per se. In this context, empirical tabulated values that are stored in a memory can also be utilized, for example, to determine the film thickness.

Whereas in the configuration according to Figure 1 the same photodetector 5.7 is used to measure the intensity change and to calculate the angle, with the otherwise corresponding configuration according to Figure 2, two photodetectors 5.7 and 5.8, at different distances from incidence point P, are provided for determination of the angle. Reflected beam 10 is split at a beam splitter 5.9 into two partial beams that pass along different path lengths before reaching the associated photodetectors 5.7 and 5.8. From the different X and/or Y positions on the two photodetectors 5.7 and 5.8, the X and Y angles (and from them the angle of reflection) can be ascertained as a function of the different path lengths. One of the two photodetectors 5.7 and 5.8 can simultaneously be utilized for the intensity measurement. Figure 2 also shows the angle α of incident beam 9 with respect to a tangential plane at incidence point P, the angle [beta] of reflected beam 10 also with respect to the

tangential plane, and an angle [gamma] between the incident beam and reflected beam.

Instead of analyzer 5.4 shown in Figure 1 that is rotatable about a surface normal line, said analyzer can also be replaced by a stationary analyzer and instead a rotating polarizer 5.2 can be provided in the transmitting optical system. It has been found that the reliability of the measurement results can thereby be improved.

The transmitting optical system and receiving optical system are installed in a common carrier that is equipped with a three-point support, preferably in the form of balls or spherical caps, thus attaining unequivocal placement of the measurement apparatus on measured object 1 even at difficult-to-access points and when different curvatures are present. The measurement apparatus, being a probe, is easy to handle, and is simple to adjust because the angle of the reflected beam is automatically sensed.

Claims

1. An ellipsometer measurement apparatus for determining the thickness of a film applied on a substrate, having a light source (3) emitting an incoming beam (9), a transmitting optical system conveying the polarized incoming beam (9) to an incidence point (P) on the substrate, and a receiving optical system that has an analyzer (5.4) and conveys the reflected beam (10) formed at the incidence point (P) to a photodetector device (5.7, 5.8), the polarization direction of the incoming beam (9) and of the analyzer (5.4) being modified in time relative to one another, and the intensity changes produced thereby being evaluated by way of an evaluation device (7) in order to determine the film thickness, characterized in that

an angle measurement device (5.7, 5.8, 7.1) is provided with which the angle ([beta]) of the reflected beam (10) relative to a tangential plane of the substrate (1) at the incidence point (P) can be sensed; and that

the film thickness can be determined by way of the evaluation device (7) as a function of the angle ([beta]) that is sensed.

2. The measurement apparatus as defined in Claim 1, characterized in that the angle measurement device has a photodetector unit (5.7, 5.8) that is position-sensitive in the X and/or Y direction, as well as an evaluation stage with which the angle of reflection ([beta]) can be calculated from the position data and from distance data.

3. The measurement apparatus as defined in Claim 2, characterized in that the intensity changes and the position of the reflected beam (10) are sensed with the same photodetector (5.7) of the photodetector device.

4. The measurement apparatus as defined in Claim 2 or 3, characterized in that the photodetector device has two position-sensitive photodetectors (5.7, 5.8) arranged at different distances from the incidence point (P) in the beam path of the reflected beam (10); and that

the angle ([beta]) is calculated on the basis of the differing positions of the reflected beam (10) on the two photodetectors (5.7, 5.8).

5. The measurement apparatus as defined in Claim 4, characterized in that a beam splitter (5.9) is arranged in the beam path of the reflected beam (10) in front of the two photodetectors (5.7, 5.8); and that

each photodetector (5.7, 5.8) receives a partial beam of the reflected beam (10).

6. The measurement apparatus as defined in one of Claims 1 through 3, characterized in that a converging lens (5.6) is arranged in front of the photodetector device (5.7).

7. The measurement apparatus as defined in one of the foregoing claims,
characterized in that the transmitting optical system and the receiving optical system are integrated into a common carrier; and that

the carrier has a three-point support for placement on the film.

8. The measurement apparatus as defined in one of the foregoing claims,
characterized in that the transmitting optical system has a polarizer (5.2) and a $\lambda/4$ plate in the beam path of the incoming beam (9); and that

the polarizer (5.2) or the analyzer (5.4) is arranged in rotationally drivable fashion about an axis normal to its surface.

Abstract

The invention relates to an ellipsometer measurement apparatus for determining the thickness of a film applied on a substrate, having a light source (3) emitting an incoming beam (9), a transmitting optical system conveying the polarized incoming beam (9) to an incidence point (P) on the substrate, and a receiving optical system that has an analyzer (5.4) and conveys the reflected beam (10) formed at the incidence point (P) to a photodetector device (5.7, 5.8), the polarization direction of the incoming beam (9) and of the analyzer (5.4) being modified in time relative to one another, and the intensity changes produced thereby being evaluated by way of an evaluation device (7) in order to determine the film thickness. Easy handling and accurate measurement of the film thickness, even on difficult-to-access measured objects having differing curvatures, are achieved by the fact that an angle measurement device (5.7, 5.8, 7.1) is provided with which the angle ([beta]) of the reflected beam (10) relative to a tangential plane of the substrate (1) at the incidence point (P) can be sensed, and that the film thickness can be determined by way of the evaluation device (7) as a function of the angle ([beta]) that is sensed (Figure 1)

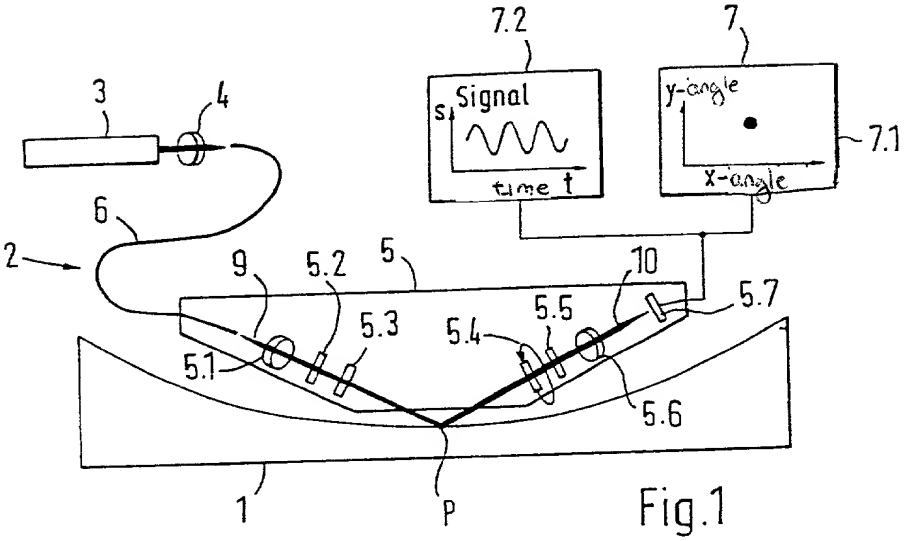
7.2
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Fig.1

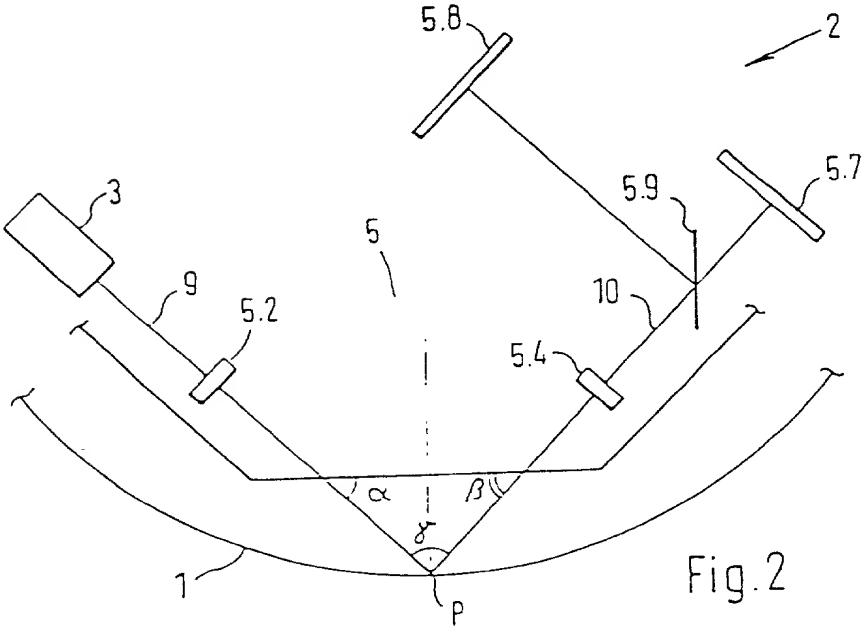
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Fig.2

09/485,925

10191/1295

COMBINED DECLARATION AND
POWER OF ATTORNEY FOR PATENT APPLICATION

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below adjacent to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled **ELLIPSOMETER MEASUREMENT APPARATUS**, and the specification of which:

[ ] is attached hereto;

[ ] was filed as United States Application Serial No. _____ on _____, 19__ and was amended by the Preliminary Amendment filed on _____, 19__.

[x] was filed as PCT International Application Number PCT/DE98/02260, on the 6th day of August, 1998

[x] an English translation of which is filed herewith.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a). I hereby claim foreign priority benefits under Title 35, United States Code § 119 of any foreign application(s) for patent or inventor's certificate or of any PCT international applications(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed:

EL179949772US

PRIOR FOREIGN/PCT APPLICATION(S)
AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. § 119

Country : Federal Republic of Germany

Application No. : 197 34 646.4

Date of Filing: 11 August 1997

Priority Claimed
Under 35 U.S.C. § 119 : [x] Yes [ ] No

I hereby claim the benefit under Title 35, United States Code § 120 of any United States Application or PCT International Application designating the United States of America that is/are listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in that/those prior application(s) in the manner provided by the first paragraph of Title 35, United States Code § 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations § 1.56(a) which occurred between the filing date of the prior application(s) and the national or PCT international filing date of this application:

PRIOR U.S. APPLICATIONS OR
PCT INTERNATIONAL APPLICATIONS
DESIGNATING THE U.S. FOR BENEFIT UNDER 35 U.S.C. § 120

U.S. APPLICATIONS

Number :

Filing Date :

PCT APPLICATIONS
DESIGNATING THE U.S.

PCT Number :

PCT Filing Date :

I hereby appoint the following attorney(s) and/or agents to prosecute

the above-identified application and transact all business in the Patent and Trademark Office connected therewith.

(List name(s) and registration number(s)):

Richard L. Mayer, Reg. No. 22,490
Gerard A. Messina, Reg. No. 35,952

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment or both under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

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